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COMMERCIAL MOUNTANTS.

BY ELLERSLIE WALLACE.

THE word mountant has long been adopted as a convenient expression to denote the mixture made use of to confine paper prints in their proper position on the cardboard. It is thus one of our technical terms in photography, but persons sometimes go wrong in the use of even these simple expressions, and we remember once seeing this term mountant translated into a German photographic contemporary by language meaning a man who goes up mountains!

The chemical relation between mountants and the fading of mounted prints is a matter which still commands the attention of practical photographers, and it is to be regretted that no specific directions how to make silver prints permanent can be given. It is impossible for us to say, Make your prints on this or that paper silvered thus, toned thus, and fixed and mounted thus, and then they will never fade. All that we can do is to take the ripened experience of many years and say, Avoid certain things in making your prints, for it is known that they cause fading in a comparatively short time.

Commercial mountants may be divided into three classes, the gelatinous, the starchy, and the mixture of the two together. Now nothing is more convenient than to have a bottle of mountant always in readiness, so that prints may be mounted at short notice; but is this proceeding a safe one as regards the permanency of the print? While we believe that an affirmative answer

might be given in the case of platinum and perhaps bromide prints, we certainly condemn the using of any other mountant than a fresh-made one for prints made on silvered paper; moreover, we assert this most strongly against gelatine mountants of all kinds, but particularly those to which glycerine has been added.

Some of the less conscientious persons in the photographic calling do not scruple to mount silver prints with the commonest kind of glue. We merely allude to this matter in order to express our strongest disapprobation. Almost everybody knows that the difference between refined gelatine and common glue is one of degree rather than of kind; but even the finest commercial gelatine is not now deemed safe. Gelatine is a substance possessing a strong affinity for water, and this is greatly increased by the addition of glycerine. The glycerine is very desirable, almost indispensable indeed in a pure gelatine mountant, because it renders the mixture less horny, and more workable. Now it is open to doubt whether prints mounted with such a compound ever really dry. We have known prints so mounted, and kept in a perfectly dry place, to leave their mounts at the slightest touch, while others framed and hung on a wall began to fade almost immediately.

These remarks will be understood as applying to the ordinary silver print on either albumenized or plain paper. As we said a moment ago, platinum or bromide prints could fairly be expected to last better, because neither of them contain that delicate albumeno-silver compound upon which the beauty and the instability of the silver print both depend. It is also well known in photography that all developed images are more permanent and lasting than those which are "printed out." On this ground alone, better results in permanency are to be expected from bromide and platinum.

There is a class of commercial mountants partly or wholly starchy in character. All the forms of parlor pastes rank in this category. It seems strange that while plain boiled starch fresh-made is the best and safest mountant, flour-paste should have always been in bad odor amongst photographers. Yet practice

and experience—the safest guides to follow—prove this to have plenty of foundation. Pastes made of ordinary wheat-flour are very prone to mould; and while this tendence can be counteracted in great measure by certain additions, they themselves have an injurious effect either upon the silver compounds in the print or upon the whiteness of the paper. Dextrine also belongs to this class, being a derivative of starch. Gum arabic is out of the question; being at once too much inclined to turn sour, and very expensive if good qualities are selected. India-rubber was at one time quite in vogue, and if it played the same trick as gelatine with glycerine, in letting the print scale off after a time, it was at least harmless as regarded any injurious effect upon the stability of the print.

Silver prints of large dimensions are sometimes sized with a gelatine sizing and varnished. The practice cannot be called a safe one however. Recent experiences point strongly to the danger of using gelatine in any form with a silver print. This applies also, we regret to say, to the cementing of prints to glass. It is probable that Canada balsam could be made to serve for this purpose. If gelatine must be used, however, we advise the best quality only, carefully tested for acidity, and used if possible without glycerine. If the prints peel off the glass, the glycerine will have to be added. Cemented prints ought always to be hermetically sealed in their frames, or at least as nearly so as possible, and hung in a place perfectly free from dampness.

On talking these matters over with one of our oldest and best photographers, he went so far as to condemn commercial mountants altogether, calling them "a lazy man's resort." While this may be an extreme view to take of the matter, so far as amateurs are concerned, we are nevertheless sure that it is the correct and safe one for the professional photographer. Starch paste, the best and safest mountant, is made in a few moments with little or no trouble and expense. It should be made fresh every day and never kept over; and the brushes and vessels well washed the last thing at night, to be dry and ready by morning.

DRY MOUNTING.

BY F. STOLZE.

Translated from the German for the AMERICAN JOURNAL OF PHOTOGRAPHY.

IT is an old complaint that photographic prints will cockle after mounting, and that only the heaviest mounts offer a remedy. This is but natural, as the prints expand when moistened with the paste, or when soaked previous to mounting. As the mounted print dries it contracts, and the cockling commences.

Many are the various remedies which have been suggested. The best of all these suggestions is without a doubt the process known as "dry mounting," in which the print is first coated with the mountant, dried, and then attached under great pressure to the mount which has been slightly dampened.

To produce a sufficient pressure the ordinary screw press is not sufficient; excellent results, however, are to be obtained by placing the mount and picture face down on a polished stone, and then passing the whole through a lithographic press. A similar result can be attained by aid of a photographic roller press if a polished steel plate is substituted for the stone.

As the professional photographer never possesses a lithographic press, and only in occasional instances a rolling press, the latter is mostly used for the purpose of dry mounting. There are, however, several great disadvantages connected with its use, as it is far from advisable to bring dampness in contact with a polished steel plate, as it easily rusts, and becomes useless for photographic purposes; further, it is difficult to place the print and mount face down on the steel plate without getting the print out of position. Another trouble is that almost all photographers, professional and advanced amateurs, use an ordinary burnisher, and have no rolling press. Such being the case the question now arises what is best to be done? There is in fact a simple apparatus to be found in almost all domestic households, which answers the purpose thoroughly without any of the disadvantages attendant on the use of a roller press. The apparatus is nothing more nor less than an ordinary wringing machine.

The method of use is an easy one, viz.: Brush the print over with paste or mountant while yet damp and untrimmed; when dry, press under a copying press, and trim to requisite size. Then dampen the face of the mount with a wet sponge, place the print upon it, and lay over it a piece of thin zinc, and pass the whole through a tight wringer. If the print is on aristo or gelatine paper the zinc plate must be first rubbed over with talc. This method of mounting is absolutely safe, very easy of manipulation and handy; the prints dry quickly, and adhere well. No paste can squeeze out from under the edges, and a soiled mount is an impossibility.—*Photographische Nachrichten.*

[Even better results may be obtained by substituting a ferrotype plate for the zinc plate.—ED.]

AMIDOL.

A NEW developer has lately been brought to the notice of the photographic public, under the name of Amidol. This new substance, which emanates from the laboratory of M. J. Hauff in Feuerbach, Germany, differs from all similar substances as it acts as a developer without the addition of any alkali; mixed with neutral sulphite of soda it produces a very energetic developer. Judging by the sample received from the inventor, it certainly seems like a valuable acquisition to the already numerous photographic reducing agents, and may prove of especial value to tourists and amateurs.

In making our experiments we followed the formulæ published by the manufacturers, viz.:—

Amidol - - - - - -	8 parts.
Sulphite of soda - - - - -	80 parts.
Water - - - - - -	800 parts.

As a retarder a few drops of bromide solution 1 : 10 proves of advantage, while a concentrated solution of neutral sulphite of soda acts as an accelerator.

The stock solution diluted by three to four times its volume of water made a rapid and safe developer, the image coming up

rapidly and gaining in density without danger of fog. After repeated use, however, the action was somewhat similar to Rodinal as it becomes yellow and rapidly loses its efficacy.

Several modifications of above formula have already been published in Europe and England, and it is more than probable that as the Amidol gets into general use, still different combinations and modifications will be worked out. From appearances thus far, Amidol is likely to prove the most dangerous rival which pyrogallic acid has thus far encountered.

The American agents of the Hauff Laboratory state that they cannot definitely answer whether the salt is poisonous or not but will submit the question to the manufacturer. Personally they do not think that amidol is any more poisonous than Eikonogen, Rodinal, or Hydrochinone.

As to a permanent supply of uniform strength and quality they state that they have not the least doubt but that the same will be so supplied.

In the English patent specifications the following information is given:

THE USE OF AROMATIC AMIDO COMPOUNDS AND OF DERIVATIVES OF PHENOL FOR THE DEVELOPMENT OF PHOTOGRAPHIC IMAGES. JULIUS HAUFF, Feuerbach near Stuttgart, Germany.—*September* 17, 1892.

THIS invention has for its object the use for developing latent photographic images or views of substituted amido-phenols which have the property of dissolving readily in carbonates of the alkalies. These compounds belong to the "glycine" class, and are produced by replacing an atom of hydrogen in the group NH_2 of the amido-phenol by an acetic acid residuum. The typical formula for these compounds is:—

$$C_nH_{2n-8}\,OH.\,NR.\,CH_2COOH.$$

These compounds are the glycines of the following amido-phenols:—

1. p-amido-phenol,
2. o-amido-m-cresol,
3. m-amido-o-cresol,

4. m-amido-(v-) m-xylenol,
5. m-amido-p-xylenol,
6. o-amido-(v-) o-xylenol,
7. o-amido-(s) m-xylenol.

These compounds are used in solution with sulphites and carbonates of the alkalies for the purpose of developing latent photographic images or views.

For instance, I dissolve in one hundred c.c. of water, four and a half grammes of crystallized sulphite of soda, one and a half grammes of glycine, and two and a half grammes of potash, this compound forming a developing means particularly suitable for the development of landscapes. For portrait work and the like, the solution may be concentrated or further diluted, according to the temporary conditions as to light, plates, etc.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—The use of the glycines of the following amido-phenols for the development of the photographic views or images in layers containing halogen silver:

1. p-amido-phenol,
2. o-amido-m-cresol,
3. m-amido-o-cresol,
4. m-amido-(v-) m-xylenol,
5. m-amido-p-xylenol,
6. o-amido-(v) o-xylenol,
7. o-amido-(s-) m-xylenol.

Rifle Bullets are now photographed in their course by means of the electric spark. The camera is taken into a dark room, which the bullet is caused to traverse. As it passes the camera it is made to interrupt an electric circuit and produce a spark, which illuminates it for a instant and enables the impression to be taken. The wave of condensation in the air before the bullet and the rarefaction behind it are visible in the photograph, and can be studied by experts, thus enabling the form of ball or rifle which minimizes the resistance of the air to be selected.

A SUCCESSFUL PICTURE.

BY XANTHUS SMITH.

A VERY useful practice in looking at works of art, is to analyze them as to their constitution, by way of determining their merit or demerit, their success as to attainment or failure of aim.

We are shown a picture, for instance, which appeals at once to us, and averting our attention, conveys to us some sentiment so completely in union with our ideas that we are extremely gratified by it.

Let us ask ourselves, always, what it is in a successful picture that gives to it its attractiveness. Of course the character of mind of the individual impressed must be taken into account, and of those to whom the representation of the boxer, the prize pug or the favorite trotter appeal, we will have nothing to say at present, but we will confine our remarks to persons possessed of sufficient sentiment to appreciate the beauties of subjects worthier of portrayal.

Subjects embodying representations of scenes in human life, will always be found the most attractive to the largest number of persons, and when the scenes or incidents represented portray occurrences connected with the higher sentiments and passions, they will be the more acceptable and interesting to right-minded people, and will take a higher place as educators in the great field of art education. Nor is it necessary that these incidents be derived from the high-flown tales of mythology, or be a pictorial embodiment of our Christian faith, such art being out of the pale of the aspirant with the camera. Indeed, mythological and sacred art can be touched but by the very few. The ability to be great in these walks may truly be accounted a divine gift, in proof of which we have only to sight the career of our great Benjamin West, who, born of unartistic parents, belonging to a sect that disapproved of art, and in the utmost seclusion from all art influences, had planted within him the divine gift which enabled him to become one of the greatest of historical painters;

his brother artists, distinguished connoisseurs and princes all agreeing in according him the exalted position which his merits entitled him to hold.

While photographers cannot aspire to these higher subjects on account of their imaginative and creative character, they may yet study such work, and derive pleasure and benefit from it, and apply many of its principles to the more humble, yet often no less attractive and touching, walks of genre or everyday art.

The field in domestic art is large for the photographer, the scenes and incidents constantly taking place about us afford a great many opportunities for producing very interesting pictures, especially as they may so often be made to embody women and children, around whom are entwined all the higher and more refined sentiments that grace the domestic circle.

In the portrayal of domestic scenes the utmost amount of taste and skill may be shown in the selection of incidents, the grouping and the artistic effects of lighting.

The selection of models in every way adapted to the incident to be depicted, is a matter of prime importance, the refined and classical for the more elevated subjects, and the ragged and character-marked for the picturesque. There should always, however, even in the picturesque, be sufficient grace or sentiment to lift the work out of the commonplace or vulgar. The separation of the purely picturesque from what is absolutely commonplace is a nice point, difficult ground to travel upon. There should be a certain dignity in picturesque old people, and a certain grace and beauty, what is called rustic beauty, in picturesque children to lift them out of the vulgar.

In genre subjects, embodying the picturesque solely, they will be much elevated by a due care to the grace of composition and harmony of effect of light and dark, though this should not be relied upon entirely. Flemish art, though it is admired for its artistic perfections, is yet justly open to severe criticism for the want of more elevation in its portrayal of commonplace life. Some of the finest productions of the Flemish masters as pictures are yet so low in sentiment, so steeped in commonplace vulgarity, as to be absolutely repulsive.

Let the photographer keep in mind in his work a standard of purity and grace and beauty that will elevate all that he does. Let him select for his old people those possessed of large, well-formed features, and having a look of mind, and for his children the plump and symmetrical; and let him by all means avoid the extreme peculiarities of fashion in attire, especially when such fashion is at variance with the graceful or the picturesque.

In making groupings the background plays an exceedingly important part. The simple varied background, light at one corner and dark at the opposite, against which the portrait photographer daily poses a head, gives the cue to an important art secret. Groups arranged against flat, equally lighted backgrounds, be they either light or dark, can never produce fine or interesting pictures, as the whole will be equally cut out, and hardness and dryness and consequent want of interest will be the inevitable result. The secret is probably the pleasurable sensation given by the variety which contrast begets, but certain it is, that the interweaving of lights and darks, the interchanging of light against dark and dark against light, gives us our most captivating effects.

Avoid large patches of strong light or strong dark in garments. If such surfaces be admitted into a picture, and if they happen to be of angular and ill-shapen form, they will utterly destroy any artistic pretensions in the picture. Seek to attain in the attires broken hues and quiet broken patterns, with a small amount of concentrating depth and high light in well-formed spots.

To come back to the subject of the background, which is an exceedingly important one, it may be taken as a rule that the more important your subject the quieter should be the background. All that may be introduced in it to give interest and break up its baldness and assist in telling the story, should be kept in absolute subordination to the principal aim of the work.

In looking over what may be considered very successful pictures, which we are sorry to say are only too rare amongst the large amount which falls under our observation, it will be found that the secret of success is in the perfect fitness of the models to

the aim of the story to be told. Their freedom from stiffness, nature caught in her graceful mood, the absolute subordination of the background to the subject, the subject or groups being in parts lost in the background, the most violent relief being in the principal points to be brought forth, and the accentuation of focus on the principal features of the subject. All this attained, with a good telling incident, must, we feel confident, invariably secure success for a photograph.

SELF-TAUGHT MEN IN LITERATURE.

DANIEL DEFOE, the author of "Robinson Crusoe," one of the greatest writers of prose fiction that ever lived, began life as a hosier, and was almost wholly self-taught. William Cobbett, the great writer of racy Saxon English, was in early life a farmer's boy, and afterwards a common soldier. Izaak Walton, the pleasing biographer and "complete angler," was a linen-draper.

Then in science. Thomas Simpson, the distinguished mathematician, wrought for the greater part of his life as a weaver. Captain Cook, one of the most scientific of English sailors, and a very pleasing writer, was wholly self-taught. His father, a poor peasant, learned to read when he was turned of seventy, in order that he might be able to peruse his son's voyages. Arkwright, subsequently Sir Richard, the inventor of the cotton-spinning machine, was a poor man, and commenced life as a barber. James Brindley, the author of canal navigation in England, the first who tunneled great hills and brought ships across navigable rivers on bridges, was a millwright. Herschell, subsequently Sir William, originally a musician in a Hanoverian regiment, became a skillful optician and a great astronomer. To him Campbell refers in the well-known line:

"Gave to the lyre of heaven another string."

Then for the fine arts. Chantrey was a milk-and-butter boy, and his first mouldings were in softer materials than marble. Sir Thomas Laurence was the son of an inn-keeper, and wholly

self-taught. John Opie was found by Dr. Walcott working in a saw-pit. William Hogarth, the greatest master of character that ever developed his ideas by means of the pencil, served his apprenticeship to an engraving silversmith, and commenced his professional career by engraving coats-of-arms and shop bills.

Then in poetry. Gifford, the first editor of the *Quarterly*, began life as a poor sailor-boy, and afterwards served an apprenticeship to a shoemaker. Bloomfield wrote his best poem, the "Farmer's Boy," while he too worked in a garret as a shoemaker. "Ben Jonson," says Fuller, in his "English Worthies," worked for some time as a bricklayer and mason. He helped to build the new structure of Lincoln's Inn, when, having a trowel in his hand, he had a book in his pocket. Shakespeare was a poor man's son; his father could not write his name, and his cross and mark still exist in the record of Stratford-on-Avon to attest the fact. The poet's own education seems to have been very limited, and tradition describes him as having lived for a time by very humble employments. Then turning to theology, the highest range of all, we find the two Millers, Doctor Isaac, dean of Carlisle, and his brother Joseph, author of the well-known "History of the Church," began life as weavers. Dr. Prideaux, author of the "Connection" and Bishop of Worcester, got his education by entering Oxford as a kitchen-boy. John Bunyan, the greatest master of allegory, and author of the second-best book in all the world, was a self-taught tinker. These be some of England's hosiers, and linen drapers, and millwrights, and masons, and sailors, and shoemakers, and weavers, and barbers, and tinkers, who have thought and written to some purpose,—an honor to themselves and to the prosaic calling in which the earlier part of their life was spent, before their superior brain-power asserted itself for the good of future generations.

Looking Pleasant, Please.—"By thunder, old fellow, what has happened to you that you smile so all the time? What is it so good?"

"Oh, nothing at all, but you see one never knows nowadays but somebody may be photographing him."—*Fliegende Blaetter.*

EARLY DAGUERREOTYPE DAYS.—VI.

AN HISTORICAL RETROSPECT.

BY JULIUS F. SACHSE.

(*Continued from page 459.*)

IN a previous paper mention was made of the crude apparatus improvised by the early American experimenters in the Daguerrean process. The evolution of the photographic camera through its various stages from the first box camera of the French experimenters to the present complex and perfected outfits, with their facilities for adjustment in height, angle of presentation, and for focus, and arrangements for introducing and withdrawing slides, is in itself an interesting study, and forms an important contribution to the history of the development of photography.

The camera used by Daguerre was an exceedingly simple piece of mechanism. It consisted simply of a wooden box (A, Fig. 1), painted black on the inside. At one end was the

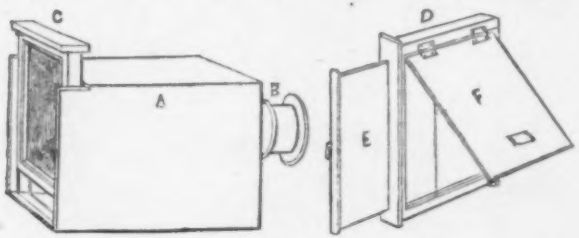


FIG. 1.

arrangement of the lens (B), and in the opposite end a groove was cut in which slid a frame holding the ground glass (C). The latter was intended to be in focus with the lens. (D) represents the frame for holding the silver plate, and is shown open; (E) the dark slide, being down. The plate was placed in the frame, and the flap (F) closed, this of course being done in the dark. As tripods and an adjustable focus were not then known, the camera, when used for an exposure, was placed on a table and moved

back or forth until the correct distance to suit the fixed focus was found, when it was ready for the exposure. Great care had to be taken not to move or jar the camera, as otherwise the image would be blurred.

This simple apparatus was soon improved by the French mechanics, so that one-half of the body slid into the other half, or telescoped. The lens was also set in a separate tube, with a rack and pinion arrangement; this allowed a much greater range. Lenses differing in focal length could also be utilized when necessary. This type of camera is still known as a "box camera."

An English improvement soon followed,—making all sides equal, which allowed the holder to be inserted so that horizontal or vertical views could be taken. Heretofore the French cameras had to be turned on their side to change the position of the plate.

As soon as Daguerrean portraiture became an established fact, and the German opticians commenced to assert themselves, a novel apparatus was invented in Germany designed exclusively for portraiture. This was made entirely of brass, so that variation of climate had no effect upon it; it was portable, and occupied but little space. It became known as the "German" or "Voigtlander" Camera (Fig. 2). The brass foot (A) is placed upon a table or other firm support, and the pillar (B) screwed into it. The body of the camera (CC) is laid in the double forked bearing (DD). The instrument is now properly adjusted by means of the set screws (*eee*) in the brass foot, or it may be raised, lowered, or moved from one side to the other by the telescope stand, and

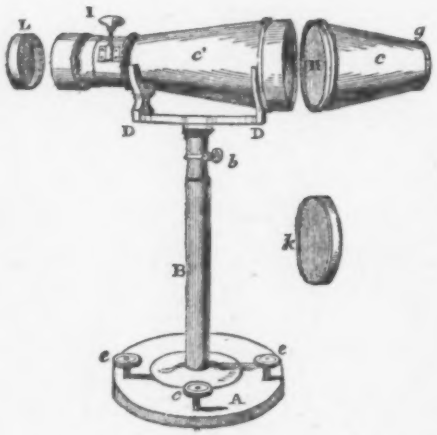


FIG. 2.

when correct fixed by the screw (*b*). The portrait to be delineated is viewed either through the small lens (*g*), or with the naked eye on the ground glass plate (H), the focus being adjusted by the screw (I). The optical part of the instrument consisted of a small set of achromatic lenses.

When the portrait to be taken was delineated on the ground glass to the satisfaction of the operator, the brass cap (L) was placed over the lens, and the entire body taken into the dark room, taking care not to disturb the position of the stand. The body was then detached at the part (H), and the prepared plate, inclosed in the brass frame (K), introduced into its place. The whole was then again placed in position on the pedestal before the sitter; the brass cap (L) was then removed, by which the plate was exposed to the full influence of the light, after which the cap was again replaced.

To return to our own country:—

Our American experimenters had nothing to guide them in the construction of apparatus except the meagre descriptions of Daguerre's crude box, consequently almost all were thrown upon their own resources and ingenuity. It has already been told how Joseph Saxton and others improvised the necessary implements from such material as they had at hand, also how the former came to Robert Cornelius with request to make for his use a camera, fuming-box, and mercury bath of tin. These attempts to secure practical working apparatus soon led to the construction of an apparatus for Goddard and Cornelius, which for ingenuity, excellence of workmanship and utility, are not excelled even to the present day. Another instance where American ingenuity asserted itself; the mechanic who constructed Cornelius and Goddard's first studio outfit was Joachim Bishop,[1] a young man

[1] Joachim Bishop came to Philadelphia in 1811, when five years of age. In 1826 he served an apprenticeship with a jeweler, and afterwards as a brass-worker; from 1832 to 1839 he was employed by Dr. Robert Hare, Professor of Chemistry, as an instrument-maker and assistant.

In the year 1839 he left there, and commenced business as a philosophical-instrument-maker in Philadelphia, and thus became the first maker of photographic apparatus in America. In 1845 Bishop commenced to work platinum, and drew the first premium at the Franklin Institute exhibition for that year. For many years he was the only refiner and melter of platinum in America, and at the Centennial Exhibition in 1876 he was the only exhibitor of platinum work in this country.

who was then an assistant to Dr. Robert Hare, Professor of Chemistry at the University of Pennsylvania. Bishop was a natural-born genius, and for many years the best maker of philosophical instruments in America, and in later years will be remembered as the only man in America who could smelt and refine metallic platinum.

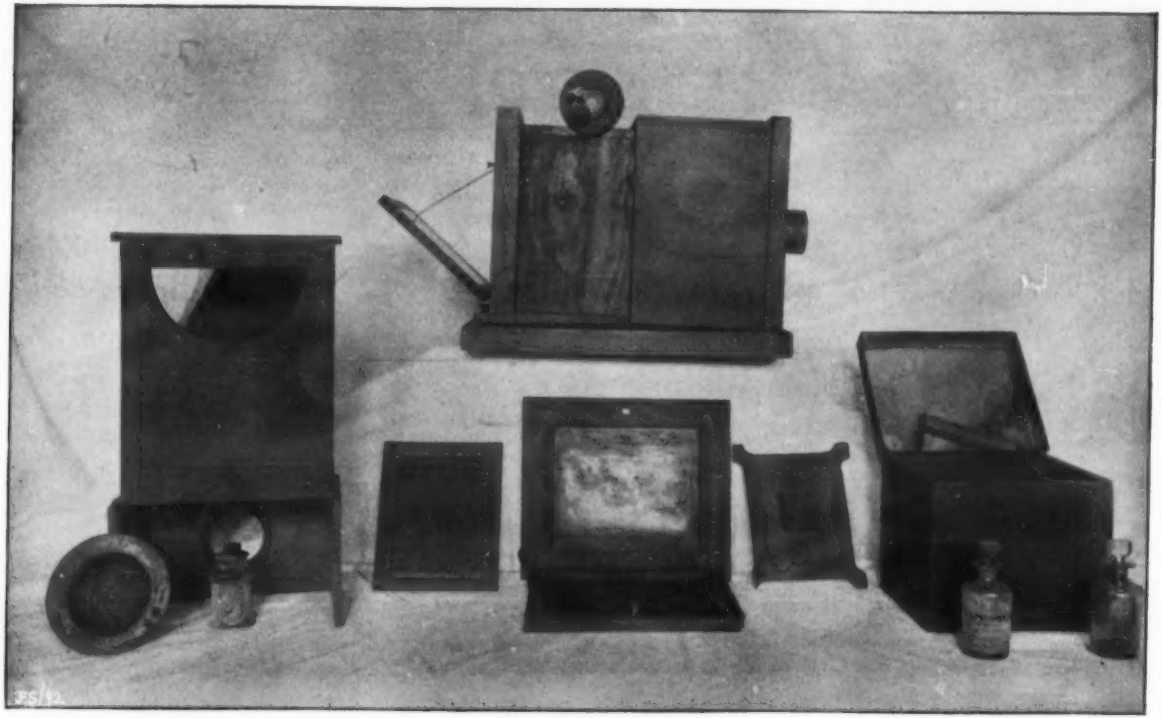
This American camera was of the sliding-box order, made of white pine wood, and blackened within and without; and was intended to be portable, as when extended its full length all the other pieces of apparatus were made to fit inside (see illustration). The camera proper, or that part fastened upon the base board, was 10 inches high by 12 inches wide; outside measurement. The depth was 7½ inches.

The rear or sliding part, lined throughout with black velvet, measured inside 8½ by 10 inches and 7¾ inches deep. This made the interior, when extended, measure 14 inches from front board to ground-glass. The telescoping was controlled and fixed by a tightening screw, which worked in a groove in the base-board, similar to many still in use. The lens, called in that early day a periscopic—achromatic—is 2 inches in diameter, set in the back of a sliding tube two inches long, the front of which was protected by a brass cap having an orifice nine-sixteenths of an inch in diameter. This was controlled by a brass shutter.

The focusing arrangement was movable, similar to those on our most improved cameras; the opening for the ground-glass is 4½ by 6 inches, the glass being merely fastened in with gummed paper. Upon the outside of this back there was attached a flap upon the inside of which was a mirror 4½ by 6 inches; also a hook and staple which set the mirror at an angle of 45 degrees. This novel arrangement was used for focusing the image, which was reflected from the ground-glass upon the mirror.

After the proper focus was obtained the back was removed, and a plate-holder substituted. This was also of novel and crude construction; the back which held the plate was loose and made

Bishop was a self-taught man: all of his education was acquired during his working hours from reading and studying by himself. His health failing, he gave up the philosophical instrument business in 1858, and removed first to Radnor, then to the hamlet of Sugartown, Chester Co., where he died a few years ago.



STUDIO OUTFIT OF DR. PAUL BECK GODDARD, PHILADELPHIA, 1840.

Lens and Shutter.
Camera with body extended, showing mirror set for focussing.
Fuming box ready for use, with glass to view process during development.
Plate holder, with original coated plate open for exposure.
Coating box, with rake to distribute chemicals on tray.
Iron mercury bath. Brass spirit lamp.
Tray for chemicals used in coating plates.
Diffuser for Vapor.
Mercury bottle. Iodine bottle.

PHOTOGRAPHED BY JULIUS F. SACHSE, WITH WRAY LENS ON ORTHOCROMATIC PLATE.

REPRODUCTION IN HALFTONE BY ELECTRIC LIGHT.

of soft wood; the daguerreotype plate was held in place by four ordinary carpet tacks, and the grooves were made so as to fit the camera, fuming-box, and mercury bath. To protect the sensitized plate a flap lined with black velvet was used, hinged to the back proper, and controlled by a strip of leather which was pulled through a slot in the side. When all was ready for the exposure, a tap or two on the camera dropped the shutter, and when the exposure was complete a pull on the leather thong closed the flap, and protected the plate. The plates used were 4¼ by 6½ inches.

The fuming-box, 8 by 6½ inches and 6½ inches high, had a novel arrangement for fuming the plate evenly. A piece of wood was so placed between plate and chemicals that it could only arise about the sides of the box, thus insuring an even coating.

The mercury bath was an ingenious contrivance, which when folded measured 9 by 5½ inches and 11 inches high. When set up it was 6 inches higher, the latter forming a space under the iron mercury bath for the spirit lamp used to heat the mercury.

The iodine, bromide, and mercury used were kept in glass-stoppered bottles which fitted into the fuming-box.

Such was the primitive apparatus with which was solved the question of heliographic studio portraiture half a century ago. It is, however, a noteworthy fact that all the early processes in photographic portraiture achieved in Europe and America were gained by the use of apparatus modeled after the primitive Philadelphia outfit here described, together with the chemical discoveries of Philadelphia scientists. For many years some of the most noted daguerreotypists in Europe were Americans, as for example Mayall in London and Thompson in Paris. Further, a reference to some of the old advertisements will show that many of the most celebrated native French, English, and German operators in their respective countries advertised *Daguerrean Miniatures by the American Process.*[2]

The above outfit has lately come into the possession of the writer, in precisely the same condition as when last used in

[2] Humphrey's *Daguerrean Journal*, Vol. I., p. 25, November, 1850.

October 1840. The camera, fuming box, mercury bath, chemicals, holders, even to a coated plate in the holder, all just as they had been stored away in 1840,—over half a century ago.

The circumstances connected with this interesting discovery are as follows.

Shortly after Cornelius opened his studio at Eighth street and Lodge Alley, Dr. Paul Beck Goddard also fitted up a studio in his house on Ninth Street above Chestnut, opposite the University of Pennsylvania. During the fall term of 1840 Dr. Goddard was called to act as demonstrater of anatomy (permanently appointed 1841), which required all of his time and attention. He then offered his whole Daguerrean studio outfit, a duplicate of that used by Robert Cornelius, to the now well-known engraver, John Sartain, then a young man just starting upon his brilliant artistic career.

Our historical retrospect being brought to the attention of Mr. Sartain, who is now in his 84th year, he recalled the circumstances of his Daguerrean experiences of over half a century ago; further that the whole of Goddard's apparatus must still be stowed away in the loft of the residence formerly occupied by him in Sansom street in Philadelphia, there he placed it fifty-two years ago.

He at once sent word to the writer, whom he has well-known for over a quarter of century. An investigation proved that Mr. Sartain was right in his surmises, and there, stowed away in an out-of-the-way closet in the unoccupied house, were found the interesting relics of photography, covered by the dust of years, after an undisturbed rest of over half a century.

Mr. Sartain, whose mind and memory is still as clear and bright as his eye, recognized each part and piece when brought forth just as if they had been left but a week ago. Upon being asked as to the circumstances of his connection with photography he stated that the first imformation he received of the discovery was at a reception to the "Artist Fund Society," held in the latter part of 1839, at the house of a well-known architect, who lived on the north side of Filbert street, above Eighth. At this gathering a letter was read from Samuel Morse in Paris, relative to Daguerre's process. This was received with considerable

ridicule by most present. After the discussion the consensus of the meeting was that they could believe Herschel's moon story, but this one—never. One of the strongest opposers to Daguerre's claim was the speaker, John Sartain.

However, after Saxton had demonstrated the correctness of the invention, Mr. Sartain became greatly interested in Daguerre's process, and was a frequent visitor at Dr. Goddard's house. After the latter received his appointment as demonstrator of anatomy, he offered to sell to Mr. Sartain his whole studio outfit for the sum of forty dollars. This offer was finally accepted, and Mr. Sartain came into possession of the only studio outfit in America except Mr. Cornelius'.

At this time the Franklin Institute was holding an exhibition in the old Masonic Hall on Chestnut street. To give additional space the lawn in front of the hall had been enclosed with a wooden structure covered over with sheet iron. Mr. Sartain, the Chairman of the Committee on Fine Art, attempted to make a daguerreotype showing the annex with the hall in the background. For this purpose he placed the camera on the sill of a second-story window of a house opposite to what is now the Washington House. After the exposure was made, and removed to his house for development, it was found to be over-exposed. Mr. Sartain then rubbed the image off, and ground the plate on a buff, first with pumice-stone, then rotten-stone, and finally with rouge. On the next day Mr. Thomas P. Cope, a well-known Friend and shipping merchant, called on Mr. Sartain to take a daguerreotype of Haverford College,[3] to be engraved and used as a frontispiece to a pamphlet report for that year. Among the plates prepared was the one above described, and by some chance it was the one exposed on the celebrated Quaker College. Mr. Cope, desirous of seeing the development, returned to the city with Mr. Sartain. When the plate was put in the mercury box, to the surprise of both watchers, straight lines appeared upon the plate. These soon changed into the buttresses and tall Gothic windows of the Masonic Temple, showing over the roof of the shed in front. In fact, when finished the original picture of the

[3] Nine miles west of Philadelphia.

previous day was on the plate,—not a vestige of the second exposure was to be seen. This curious plate remained in Mr. Sartain's possession for many years, and may be still in existence.

This second failure in Mr. Sartain's attempts at daguerreotypy so disheartened him, that the apparatus was put away, and there lay undisturbed and forgotten for so many years, until now resurrected at the instance of the writer.

The Focometer.

Of the many trials which beset the early experimenters in the Daguerrean process, none were greater than to obtain a suitable lens, and after one was obtained to know whether or not it worked to focus. For this purpose an instrument known as the focometer was improvised. It consisted of a stand, upon which eight small fans were arranged in a spiral form around a horizontal axis at different distances, so as to be all visible at once from the lens. These fans were numbered from one to eight, and when it was desired to try a lens the focus was taken upon No. 4. If in the finished daguerreotype that number proved to be the sharpest, the lens was right, and worked to focus. If No. 2 or No. 3 were sharper, then the lens had to be racked so much nearer the ground-glass after the focus was taken upon the sitter or subject. On the contrary, if No. 5 or No. 6 were the sharpest, then it proved that the lens was over-corrected, and had to be drawn out a little further away from the ground-glass.

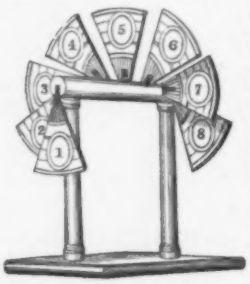


Fig. 3.

The method of testing a lens for flatness of field in the early days of photography was simply to expose upon a window sash, which in those days always contained a number of small panes of glass. If all the bars appeared upon the ground-glass perfectly straight, it was proof positive that the lens was suitable for a photographic objective.

COLOR PHOTOGRAPH OR COLOR VALUE.

OUR sparkling neighbor, the *Photographic Pointer*, in its last issue, publishes a leader under above title, in which it is set forth that "No little harm has been done in the past, and will probable continue to result in the future, from the way in which many of the daily and other papers have reported and commented on the various attempts of scientists to reproduce by photography the value of colors.

"A majority of such commentators seem to jump at the conclusion, and to expatiate thereon, that photography claims to have the ability of reproducing on a sheet of sensitized paper, in the form of a positive print, in the colors of nature, to a greater or lesser degree, such subject as may be placed before the camera.

"It is a pity that public sentiment should be so imposed upon as it has been in this instance, for while the future may perhaps hold in store this possibility, those searching now for the solution of the color problem are much more modest than this would seem to indicate, and feel that a great advance will be made when it is found possible to obtain negatives that will reproduce with fidelity the varying gradations or tones of color as they may be translated into the black and white of the reproduction.

"This is rapidly being approximated by the orthochromatic plates and the use of colored glass, but the general thought of the unsuspecting and wrongly-informed public is, when color photography is mentioned, that it refers to something entirely different from what it really is.

"Let, then, the more enlightened of us take every possible occasion to correct this wrong and injurious impression; let us talk and work for color *values* in photography; and when we have made the public understand what is meant by color photography, much will have been accomplished for the art."

In connection with this subject we will recall to our readers' attention the illustrated paper published in the AMERICAN JOURNAL OF PHOTOGRAPHY, May, 1891, page 202, giving a "suggestion for identifying the colors photographed," a scheme and illustration which is thus far the nearest approach to reproducing mechanically color values by photographic means.

A COLUMBUS DAY JAUNT:—ITS EXPERIENCES AND DISAPPOINTMENTS—PHOTOGRAPHY AND SUPERSTITION.

BY J. FOCUS SNAPPSCHOTTE.

DURING the early fall of the present year of grace, 1892, several members of a well-known Philadelphia society planned a jaunt to the interior of northeastern Pennsylvania, the objective point being one of those quiet out-of-the-way Pennsylvania towns where Pennsylvania German is the spoken language, and where, thus far, but few or the modern innovations have, as yet, invaded the quiet life of the community. The object of the proposed excursion was a two-fold one: first, to obtain some historical and genealogical matter; secondly, to escape the noise and bustle of "Columbus Day."

To accomplish the full aim of their main object it was necessary to have a photographer join the party. For this purpose approaches were made to a member of the old Leopardville Camera Club. The inducement set out was a sojourn at the leading tavern in the town, the host of which had achieved a more than local reputation for his broiled spring chicken and waffles. If the photographer, whom we will recognize as Mr. Snappschotte, has a marked weakness, it is for spring chicken and waffles. The bait was offered—and taken. For the intervening week the dreams of Snappschotte were interspersed with visions of waffles, chicken, apple-butter, cider, and coffee, such as are only to be had among the Pennsylvania-Germans. These visions were followed by dreams of several nights' rest in a soft, downy feather-bed, relics of years gone by—at present only to be found in a community like the one which it was proposed to visit.

To make doubly sure that there should be no disappointment, the projector of the jaunt, whom we will call "Textor," wrote to mine host of the party's coming, and good accommodations were expected, with an unlimited supply of waffles and fixings.

At last the day of the eclipse, which preceded Columbus day arrived, as announced in the almanac. In the afternoon when

the party met at the railroad station it had dwindled down to three persons, Textor, Historicus, and Snappschotte, the button-presser.

It was four o'clock when the train pulled out with the trio aboard; four hours later three hungry and weary traveler alighted at a quiet town which nestles at the base of the Blue Ridge. Quite a number of country people disembarked at the small station platform. This in itself was unusual, if not remarkable, but was explained when one asked in local "Bush-Dutch," at what time the eclipse was to come off? They had heard there was to be an eclipse of the sun that day, and so had come to town that night after work was done to see it.

The three travelers, leaving the station, wended their way up the main street. One of the first persons they met was the town constable going his rounds, extinguishing the street lamps prior to his retiring for the night. On seeing that three strangers had come to town, he re-lit the lamps, and allowed them to burn until half-past ten o'clock.

At last the chief tavern was reached; never had the camera-box and outfit of Snappschotte's felt lighter than during the long tramp from station to tavern. In this he was not alone: Historicus for the nonce brushed away the musty cobwebs of history from his brain, while Textor, with the step and elasticity of youth, cared not whether his family tree ran back to Noah of old or stopped short with the original Evan ap Evan. All this was in anticipation of the prospective waffles and chicken, to be followed by the downy couch of sweet repose. The trio, however, were doomed to a sad disappointment. The host, in place of the genial Pennsylvania-German Boniface pictured in the mind of Snappschotte, turned out to be what might be called a veritable Philadelphia Yankee, and what was more, there were no waffles, no chicken, no coffee, no apple butter, no cider—in fact, no supper. In explanation the tavern-keeper stated that he had forgotten the date of our party's coming, so had made no preparation. When reminded in forcible language that it must be a mistake, as he had sent Textor a postal card no later than the day before, his only excuse was a lame apology. After a dreary wait supper

was announced—"tenderloin" steak, well out of the neck, a fried egg, and a cup of coffee which for strength would pale the proverbial stable goat, took the place of the anticipated feast of tender fowl and lucious cakes.

During the supper the host offered more apologies; the apple butter should surely materialize to-morrow. However, the three tourists reconciled themselves with the thought of a good night's rest. After supper segars were lit, and a stroll taken through the peaceful town. So honest is the community that but few residents bolt or bar their houses at night-fall. It is not an unfrequent occurrence that front doors are left open all night in summer, with no greater risk than to find a stray horse or cow in the vestibule in the early morn.

Promptly at half-past ten the street lights were once more put out, as a reminder for all persons to retire. Returning to the tavern the party were ushered into two chambers, anything but tidy; one contained a bed and cot, the other a bed. Snappschotte secured the latter, Textor the cot, and Historicus the other bed. The visions of downy rest had vanished. Snappschotte's mattress seemed to be loaded with corn husks, Historicus' bed was about a foot too short, and the cot,—well, Textor declared in the morning that the absence of waffles the night before was now accounted for, as the irons must have been put in the cot in place of a mattress.

Long before daylight the trio were up and dressed, and comparing notes, and the work of the day mapped out. To get out of the stuffy tavern was the first idea; so a walk before breakfast was proposed—a happy thought, which not alone gave the jaunters an appetite for breakfast, but also an insight into the town life, even if it did take away all desire for apple butter.

The first thing to attract attention was a man going through the town, stopping at different houses, pounding at the doors and calling to certain persons to "*steh auf de Stahdsch is hier in a halber stund.*" This proved to be the stage proprietor, who personally awakened all citizens who had booked with him for the early stage. Another peculiarity was that women seemed to see how early they could get up and sweep off the foot-walks.

As it neared breakfast time the trio turned their steps toward the tavern. On their way they overtook a farmer who was selling from house to house *Lotwerck* (apple-butter) by the quart out of a deep firkin. Stopping for a moment to listen to the colloquy in rich local German, between seller and buyer, the party were cured from eating apple-butter during that trip. The two had come to terms; a quart was ladled out into a stone dish, and paid for; in the meantime something in the mass attracted the attention of the buyer. An investigation proved it to be a dead mouse. The seller refused to take it back, and said that the mouse made no difference; it did not hurt the apple butter; it must have got in during the night, as any one could see the mouse had not been cooked with the apples, but as long as he had found it he would refund one half the price, or give him another quart without the mouse. The trio did not stop to hear any more, but when apple butter was set before the party at breakfast, with the information that it was nice and fresh, and had just been bought of a farmer expressly for them, it is needless to say that the soggy griddle-cakes were lubricated with the strong creamery butter and cheap treacle of the tavern menu.

After the repast the trio again ventured out into the town, and among the peculiar primitive customs of the residents none attracted more attention than to see an old lady come out of her house, carefully lock the front door, place the key under the door mat, and then calmly go her way.

As the morning progressed, while Historicus was gathering historical information, Textor delving into family records, Snappschotte was photographing some of the quaint old landmarks of the town. As noon approached all the plates in the holders had been exposed. The three pilgrims meeting, a search was made for the local photographer, if such existed, for the purpose of soliciting the use of his dark-room to change plates and secure those exposed. Arriving, after inquiry, in front of the studio, quite a crowd blocked the entrance. This seemed strange, but thinking some accident had occurred, Snappschotte asked a respectable looking cilizen what had happened, and if he knew if the photographer was in. The reply, given in English, was that

no pictures were made on that day, as it was "his day." Asking for an explanation, the citizen seemed surprised at the ignorance of the questioner; he, however, continued that this was the first Friday of the new moon, and the great healing day of the quarter; further, that the photographer was a "Faith Doctor," being a seventh son of a seventh son, born with a caul, under a peculiar conjunction of stars, and thereby had the mysterious power to make a picture of a person by sun light, [Photography.—ED.] and cure all diseases by the mere laying on of hands, a power greater than any medicine doctor in the world possessed.—It was some minutes before the jaunters could believe their own ears. Looking around among the throng more closely, it seemed as if all the halt and decrepit for miles around were assembled in the street before the narrow entrance of the photographer's studio. Snappschotte and Textor, making their way with the crowd, finally squeezed up the narrow stairs, and after going up three flights got into the studio and stood in the presence of the Doctor-Photographer, who proved to be a sedate, ministerial-looking man, dressed in sombre black. The studio did not differ from the typical village gallery as seen in any country town, except that it was well filled with people, all awaiting their turn to be cured of their ailments.

Snappschotte's application for the use of the dark room was courteously granted. After reloading holders the three strangers mingled with the crowd on the stairway and street, where it was learned that most persons had implicit faith in the Doctor's powers, who gave no medicine but merely laid on his hands and spoke words. It was also learned that no charges were made, but any one could leave upon the counter as much cash as their circumstances would permit.

Seeking admission was a Pennsylvania-German farmer with his son, a boy of about fourteen years. Asking the boy's ailment, the father said that he thought the boy had a "greedy worm," and all he wanted was the doctor to rub his hand three times down the boy's back, when the "greedy worm's" head would be cut off. The greatest surprise, however, was the number of persons in the crowd who seemed to connect the process of photography

with the occult powers which gave the operator the healing power.

That such ignorance and superstition should exist in this enlightened age, in an old and religious community, as is this quiet, peaceful Pennsylvania town in question, was such a revelation to the three visitors from the Quaker City, that even the unsatisfactory accommodations at the tavern, with the attendent disappointments, were forgotten for the time.

Making their way to the little railroad station, the dust of the town was shaken off their feet, and the journey started for home. So greatly was the trio puzzled over their experiences of the last few hours, that during the homeward trip Historicus attempted to connect the matter with the Salem witchcraft of old, while Textor attempted to trace back the Photographic-Doctor's pedigree to the ancient female interviewed by Saul in days gone by.

The most dejected and miserable of the trio, however, was Snappschotte. During the whole of the excitement he forgot that he had his outfit, and thus neglected the opportunity of his life-time in not exposing upon the motley crowd which besieged the studio entrance of that quiet town where photography and superstition go hand-in-hand.

The Historical Society of Pennsylvania, one of the most active organizations of the kind in the world, has lately taken another step forward, which places it still further in advance of similar societies in this country, by the virtnal organization of a Photographic Department, by which students of history are enabled to procure photographic copies of the priceless documents and treasures stored in the archives of the institution, whilé the Society at the same time is sure of the proper and safe manipulation of the originals, which would not be the case if permission were granted promiscuously to all applicants.

The Photographic Department is in charge of Julius F. Sachse, Esq.. Editor of the AMERICAN JOURNAL OF PHOTOGRAPHY, who, in addition to his other scientific labors, has made the photographic reproduction of manuscripts, documents and oil portraits an especial study.

ON SILVER HEMISULPHATE.

BY M. CAREY LEA.

THE existence of those substances which I described some years ago under the name of photosalts of silver,[1] necessarily implied the existence of the hemihaloids of silver, also, as these latter entered into the composition of the photosalts. Similar inferences, though less definite, had long been drawn from the action of light on silver haloids. Two of these, the chloride and bromide, lost by the action of light their complete solubility in ammonia without becoming completely soluble in nitric acid. Evidently there was indicated an intermediate compound between the normal haloids and metallic silver. During the last ten or twelve years I have devoted much time to the attempt to isolate these lower compounds of silver, and to gain some certain knowledge as to the hemioxide, whose existence seemed almost a necessary inference from that of the hemihaloids. Some eight years ago, I obtained a substance having all the properties which one would be disposed to ascribe to Ag_2Cl, and a large number of analyses made seemed to confirm the view. I hesitated, however, to publish a description of it, not feeling entirely certain that it might not be a mixture, as to which a concordance of the proportions found of Ag and Cl with theory gives no sufficient information. Since then M. Guntz has described a subchloride obtained by acting on silver hemifluoride with phosphorus pentachloride and a hemioxide derived from it. Up to the present time no combination of silver hemioxide with an oxyacid has been known.

Such a combination I have been able to obtain as a double salt of hemisulphate and normal sulphate containing one molecule of each. The new salt has a light bright brown color, and exhibits a stability which, in view of its composition, is something remarkable. It has no tendency either to oxidation or to reduction. Nitric acid, unless very strong, has but little action upon it. Acid of 1.42 poured over it in large excess, and let stand

[1] The American Journal of Science, XXXIII., May and June, 1887.

for several days, gradually dissolves it completely, but the same acid diluted with two or three times its volume of water has so little action that it forms a convenient means of purification. On the other hand, ferrous sulphate, which instantly reduces argentic sulphate, has no action whatever on the new substance, even with several days' contact. Hot strong sulphuric acid has no action. It might almost be expected that under its influence the argentous salt would gradually take up oxygen and be converted into argentic sulphate. But a specimen which was covered with a large excess of undiluted sulphuric acid in a flask, and was kept under boiling water for ten hours, was not altered thereby. Another strong proof of its stability is found in its resistance to heat.

The application of heat produces a somewat curious succession of colors. The terra cotta or warm brown shade of the moist substance changes by drying above 100° to pale lilac, at 165°–170° it becomes grayish, at a somewhat higher temperature, yellowish green. Considerably below red heat it acquires a fine ruby-red color. In cooling, this red darkens almost to black, then becomes lighter again, and when cold the color is light olive-green. The changes are repeated as often as the substance is heated and cooled. No sulphuric acid vapors are disengaged even at a low red heat.

It was mentioned in a previous paper that when silver nitrate is reduced by solutions of phosphorus or hypophosphorous acid, or by acidified solutions of their alkaline salts, transient colorations were produced that seemed to suggest the presence of some form of allotropic silver. Since that paper was published this reaction has been taken up for further study. It soon appeared that when the silver salt was treated with a solution of alkaline hypophosphite, acidified with sulphuric acid, the result obtained was entirely different from that which presented itself under any other circumstances. It became clear that sulphuric acid did not act solely by setting free the hypophosphorous acid, but also acted on the silver with formation of a double sulphate.

A remarkable though limited analogy here presents itself between the substance just described and the photosalts of silver.

The silver hemihaloids are very unstable substances, but acquire stability by uniting with the normal haloids. In the same way the hemisulphate, which is not known to be capable of separate existence, becomes perfectly stable by union with the normal sulphate. The limitation to this analogy lies in the fact that the last-mentioned combination occurs in definite proportions, which does not seem to be the case with the halogen compounds.

The new substance then is formed by the joint action of sulphuric and hypophosphorous acid on a silver salt. Hypophosphorous acid has but little action on silver sulphate already precipitated, but it is different when the silver sulphate is formed in presence of hypophosphorous acid.

Several silver salts may be used. I have at different times employed the nitrate, phosphate and carbonate. The latter is perhaps the best, because the action with the nitrate is too rapid, and with the phosphate too slow, and for other reasons.

A weighed quantity of silver nitrate is precipitated with an excess of alkaline carbonate and washed. The carbonate, as well as all the other reagents employed, must be absolutely free from chlorides, otherwise the product becomes contaminated with silver chloride which cannot be removed. The silver carbonate is then treated with a solution of alkaline hypophosphite acidified with sulphuric acid. All the alkaline hypophosphite of commerce contains much more than a trace of chloride: this is best got rid of by adding to its solution a little solution of silver nitrate, stirring well at intervals, letting stand for twenty-four hours and filtering. This filtrate with addition of sulphuric acid is to be poured over the moist silver carbonate and constantly stirred. The reaction is complete in twenty or twenty-five minutes, when a bluish-black film of reduced silver begins to form on the surface. Further action is then cut short by neutralizing the liquid with alkaline carbonate. The precipitate is next to be washed several times by decantation. Very pure distilled water is, of course, needed throughout.

Convenient proportions are; 40 grams silver nitrate precipitated with excess of alkaline carbonate. Of sodium hypophos-

phite, 100 grams, dissolved in 650 c.c. of water, are treated with a little silver nitrate, and after standing and filtering, 4 c.c. of sulphuric acid are to be added and the liquid poured over the silver carbonate. After a few minutes, 6 c.c. more of sulphuric acid, diluted with a little water, are added by degrees. With this second quantity of sulphuric acid the characteristic reddish-brown color of the substance first appears.

This process may be varied by precipitating with disodic phosphate (which must be perfectly free from chloride) instead of alkaline carbonate. The action is much slower, about 24 hours being needed. Silver nitrate itself may be used, but the action is too rapid and the product is less in quantity.

The crude product obtained in either way is to be purified with nitric acid. Acid of 1.42 is diluted with three times its volume of water, and of this dilute acid a quantity is taken about double in volume to that of the precipitate and of the water left after decanting closely. After a time some effervescence takes place, but the mixture does not become warm. After standing for three or four hours over the precipitate, it is to be poured off and the precipitate washed. This treatment with acid is applied three times: the first removes a good deal of silver, the second a little, the third a trace. Each time the acid is left three or four hours in contact. The product is then washed by pouring on it a large quantity of boiling water. This is repeated four or five times, each time (except the first) placing the vessel in a water bath kept at 100° C. for several hours.

The product is either dried in the air or (for analysis) at 100° C. It forms a bright brown substance, permanent in the air, changing to violet when kept for some time at 160° C. It has the peculiarity that when water is poured on it, it makes a sharp hissing noise. This takes place with the air-dried substance as well as that dried at higher temperatures, and as much with the former as with the latter.

The substance after purification has about one-half the weight of the silver nitrate taken.

These proportions and this mode of operating are those that I have found to give the best result. But the substance is formed

under a great variety of conditions. It seems impossible to bring a silver salt in contact with alkaline hypophosphite acidified with sulphuric acid without producing more or less of it. Its presence is often completely obscured by reduced silver. But a mass that looks perfectly black and might be supposed to contain nothing but metallic silver will leave, when treated with nitric acid, a bright brown residue of the double sulphate. We have here, as before, an analogy with the photosalts. For it will often happen that a blackish mass, containing metallic silver and mixed or combined silver chlorides, will, when treated with nitric acid, resolve itself into bright purple or rose-colored photochloride.

All the specimens of this new substance contain a little phosphoric acid which cannot be removed. Reckoned as phosphoric anhydride it amounts to a little over two per cent. Three determinations gave respectively, 2.30; 2.09; 2.18, mean 2.19.

It is apparently united with silver, and this silver phosphate is united so firmly with the double sulphate that it cannot be detached. If it were not so united it would be dissolved in the nitric acid with which the substance is three times treated if it were normal phosphate, and if it were hemiphosphate it would be converted (if in a free state) to normal phosphate and dissolved.

Another attempt to remove this phosphate was made by heating the substance with sulphuric acid to 100° C. for ten hours, followed by copious treatment with boiling distilled water to wash out the sulphate which it was hoped would be formed at the expense of the phosphate. It seems difficult to believe that a silver phosphate could resist this treatment, but a quantitative determination showed that the proportion of phosphoric anhydride is not even diminished by it.

Other modes of formation than those described here were experimented on with the view of obtaining the substance free from phosphate, but without good result.

It is possible that the silver phosphate may be combined in definite proportions and the approach to uniformity of composition somewhat favors this idea. But such a view would require the assumption of a large, perhaps too large a molecule.

Analyses.

A. Material prepared from silver carbonate and dried at 100° C.

	(1)	(2)	Mean.
Ag - - - - -	76.13	76.75	76.44
O - - - - -	3.29		3.29
P_2O_5 - - - - -	2.30	2.09	2.19
SO_3 - - - - -	16.19	16.47	16.33
Water - - -	1.78		1.78
	99.69		100.03

B. Material prepared by various other methods considered less reliable.

Determinations.

Ag per cent.	P_2O_5	SO_3	O
78.59			3.93
78.45			3.69
77.16			3.61
75.43	2.18	15.61	3.29
75.46			3.25
75.35	1.77		
Mean 76.74			Mean 3.55

The determinations of phosphoric and of sulphuric anhydride are placed opposite the silver determinations to which they belong. The oxygen determinations are distinct.

The most reasonable interpretation of these results is that we have to do with a double sulphate of silver hemioxide and protoxide in which a portion of sulphuric acid is replaced by phosphoric. The proportion of phosporic acid seems to be nearly constant, three concordant analyses having given 2.09, 2.30, and 2.18, with a mean of 2.19. These proportions may be expressed by the formula

$$7(Ag_4SO_3Ag_2SO_3H_2O)+Ag_6PO_4Ag_3PO_4.$$

The comparison of this formula with results obtained is as follows :

	Calculated.	Found (Mean.)
Ag - - - - - -	76.79	76.44
SO_3 - - - - - -	15.67	16.33
P_2O_5 - - - - - -	1.98	2.19
O - - - - - -	3.80	3.29
H_2O - - - - - -	1.76	1.78
	100.00	100.03

This large molecule results from the relatively small proportion of P_2O_5, and although the figures obtained for phosphoric anhydride are very concordant, it perhaps is better to consider the substance as a double sulphate in which part of the sulphuric acid is liable to be substituted by phosphoric. If the silver phosphate is taken as adventitious, the formula becomes simply Ag_4SO_4,Ag_2SO_4,H_2O.

Decompositions.—The action of alkaline hydroxides is confirmatory of the above conclusions, and also offers further proof of the great stability of the substance.

When the double salt is placed in contact with excess of dilute sodium hydroxide it blackens, being converted into a mixture of the hemioxide which is intensely black, and the normal oxide. This decomposition, however, takes place much more slowly than with the salts of the protoxide, so that (unless heat has been applied), if after ten or fifteen minutes the alkali is poured off and the oxides are dissolved with dilute nitric or sulphuric acid, a considerable residue is found of the red-brown double salt which has escaped decomposition.

With continued treatment with sodium hydroxide (that obtained from metallic sodium was used as being absolutely free from chlorine), the decomposition is complete.

The oxide thus precipitated was thoroughly dried at 160°–170° C., weighed and ignited. Five determinations of oxygen from various specimens gave 4.73; 4.63, and again 4.24; 4.19; 4.17 per cent. of oxygen respectively. A salt with the constitution already described should yield one molecule each of hemioxide and of normal oxide, and this mixed oxide should contain 4.68 per cent. of oxygen. We have then:

	Mean of 5 determinations.	Calculated.
Oxygen per cent. - -	4.39	4.68

The double salt is more readily decomposed by hydrochloric and hydrobromic acid or even by alkaline chlorides or bromides. Under their action it instantly blackens. That part of the silver that exists in the form of hemisulphate is converted into black hemichloride or hemibromide. The extreme instability of these hemihaloids causes them spontaneously to resolve themselves into metal and normal haloid. They rarely remain as hemihaloid for more than hour or two, and often for much less time. The change is often quite sudden, and is easily observed by the alteration of color, the black of the hemihaloid passing into the metallic gray color belonging to a mixture of normal haloid with metallic silver. The hemibromide seems to be little less unstable than the hemichloride.

This instability does not render an analysis impossible, since both the products of the change are insoluble; but renders it somewhat more difficult, as the freshly-formed silver haloid tends to run through a filter. Sometimes indeed it seems as if traces of the silver chloride were for a few moments soluble in water with a yellow coloration. The appearance of this yellow color in the water is apt to be the first indication of the splitting up of the hemichloride.

Two analyses were made, one of material obtained by acting on the brown salt with dilute hydrochloric acid; this contained 81.79 per cent. of the silver. One by decomposing it with sodium chloride; this gives 81.93 per cent. A substance having the formula already given should, by conversion into chloride, give a mixture in which two-thirds of the silver should exist as hemichloride, and one-third as normal chloride. We have then—

	Found		Mean.	Calculated.
	1	2		
Ag per cent. -	81.79	81.93	81.86	82.35

a result sufficient close to afford a confirmation of the constitution assigned.

When the brown salt is decomposed with dilute hydrobromic acid or an alkaline bromide, a corresponding result is obtained. By treatment with hydrobromic acid a mixed bromide resulted which proved to contain 66.06 per cent. of silver.

A general consideration of all the reactions which I have obtained seems to indicate that the action of sulphuric acid and sodium hypophosphite on silver carbonate does not lead directly to the production of the double salt which I have described, but that the hemisalt is produced in excess, often in large excess; that the nitric acid oxidizes this excess, being able to attack the *free* hemisalt, but not that portion which is combined with proto-salt and so rendered stable. It follows that whatever has been the original relative proportion between the two salts the nitric treatment leaves always one molecule of each. If it were possible to control the formation it is not improbable that a pure hemi-sulphate might be obtained. But the action of the hypophosphite tends so strongly to carry the reaction still further that reduced silver appears, and in removing this with nitric acid the double salt results. A confirmation of this is found in the fact that the treatment with nitric acid much reduces the deep terra-cotta color of the original product. If this difficulty can be overcome we may yet obtain hemisalt isolated.

There is reason to suppose that numerous other compounds of silver hemioxide with oxyacids may exist. These compounds cannot be obtained by acting on the normal salts with sodium hypophosphite or with hypophosphorous acid, but it appears probable that they may be produced when the normal salts are formed in the presence of sodium hypophosphite. If to the last named salt we add a solution of a salt capable of precipitating silver nitrate, and then further add silver nitrate, we obtain precipitates which after standing some hours with frequent stirring appear to contain compounds of silver hemioxide. But these products do not resist the action of nitric acid; consequently there appears to be no means of purifying them and of deciding with certainty as to their nature.

When sodium citrate and hypophosphite are dissolved together and a little silver nitrate added to get rid of chlorides, then after

standing and filtering more silver nitrate is added, a precipitate is obtained which after a time appears to contain silver hemicitrate in an impure form. When a little of this precipitate is put into much water containing a trace of ammonia (five or six drops to 100 c.c.), a fine rose-red solution results.

Most oxysalts of silver are darkened by light. In a paper published in this Journal for July, 1887, I mentioned that films of these salts exposed to light and then treated with dilute hydrochloric or hydrobromic acid appeared to be converted into hemichloride or hemibromide, and argued therefrom that oxyacid hemisalts of silver must exist, and be formed by action of light on normal salts. I believe that I have been able to prove the existence of a hemisulphate with a strong probability that many other hemisalts may be formed both by the action of light and also by purely chemical means. It is possible that at some future time we may succeed in obtaining some of these compounds in a state of purity.—*American Journal of Science.*

In the Early Days of California, the daguerreotype pioneers always enjoyed a rush of business for a week before the steamer sailed, then the only means of communication with the rest of the world. These likenesses were wanted to transmit to friends in the Eastern States and elsewhere, and were sent by mail or express via the steamers. So engrafted did this custom become that in some cases daguerreotypists stipulated that their rent became due or was payable upon "steamer days."

The day after sailing-day was a general holiday in most every gallery.

A Photographic Comet.—On the 14th of October last a very faint comet was discovered by Prof. E. E. Barnard at the Lick Observatory, by photography. Visual observations last night show the comet to be about one minute in diameter. It is of the thirteenth magnitude, and is moving southeast 1 degree 40 minutes daily. Its position tast evening at 7 hours 20 minutes, standard Pacific time, was 8 degrees ascension, 19 hours 34 minutes north, declination 12 degrees 3 minutes. This is the first comet to be discovered by the aid of photography.

THE INFLUENCE OF THE PHOTOGRAPHIC PRESS.

THE editor of our valued exchange, the *Photographic Review of Reviews*, in commenting upon our expose of the dollar outfit scheme differs somewhat with us as to the influence of the photographic press, and the area of its scope. Granted that it is the non-photographic reader who is the victim, and that the photographic press does not usually reach the class of people to whom the swindling advertisers appeal, the influence of the photographic press, however, is none the less, as it is recognized and quoted frequently by the respectable secular press, and in this manner does reach the gullible class who usually snap at the bait offered by the questionable premium offers, scattered so broadcast over the land chiefly during the winter months.

Any matter that has once been in print, it may well be said never dies; as an illustration, even while writing these lines there lies on the writer's desk a late copy of *Photographic Work* with a quotation from the *Philadelphia Photographer*, published twenty-three years ago, and a copy of a daily paper with an abstract from the *Photographic World*, a magazine which has been dead and buried for almost a generation. In two other cases where the whole edition was supposed to be destroyed by fire, yet a single copy in each case survived, and are now in possession of the writer. One case was the second volume of the late Marcus A. Root's "Camera and Pencil," the other an Ephrata broadside printed by the recluse monks in Lancaster County, Pa., which was ordered to be publicly burned as soon as printed, yet a single copy escaped to be found laid away in an old book after the lapse of 146 years.

Further, we have seen quotations from our genial reviewer in far western country papers thousands of miles away from old England, while from our own JOURNAL we have met with quotations as far away as India. In concluding our remarks we will say, Let no one undervalue the influence and importance of the photographic press; it has a field of its own, a circumscribed one it is true, but which in this country as well as in Europe is cer-

tainly ably tilled by practical and intelligent husbandmen, even if the harvest garnered is not always commensurate with the value of the crop, or the time, labor, and care which is bestowed upon the soil. J. F. S.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, November 9th, 1892, the President, Mr. Joseph H. Burroughs, in the chair.

The Board of Directors reported the election of the following active members: Messrs. Richard Paxson and William G. Hopper.

It was also announced that the President had appointed the following committee to conduct the Sixth Annual Photographic Exhibition under agreement with the Society of Amateur Photographers of New York and the Boston Camera Club: Robert S. Redfield, John G. Bullock, Charles R. Pancoast, Charles L. Mitchell, M.D., and Edmund Stirling.

The exhibition will be held April 17th to 29th, 1893, in the Galleries of the Pennsylvania Academy of Fine Arts, and every effort will be made to make it the most interesting and successful of the series yet held.

The resolution offered at the last stated meeting to amend the By-Laws so as to make a change in the meeting night, was discussed at considerable length, and finally, on motion of Mr. Coates, was laid on the table.

A number of photographic novelties were shown by Mr. Morris Earle, among which were: Celluloid trays of special construction, and made in various colors; a transparent tray with a well at one end to hold the developer when tray was raised to examine the negative through the bottom. He also showed and described the Frena Magazine Hand-Camera, made by Messrs. R. & J. Beck, of London. The camera used cut celluloid films, 3¼ inches square, the magazine containing forty such films.

Dr. Mitchell showed similar negatives made under similar conditions, with the Ross Concentric Lens and Ross Portable Lens, which afforded an opportunity for studying the comparative advantages of the two lenses for different classes of work.

An interesting collection of lantern slides was shown and described by Mr. John C. Browne, illustrating a recent trip made by him to Alaska.

Adjourned. ROBERT S. REDFIELD, *Secretary.*

The Editorial Dropshutter.

The present number completes the thirteenth volume of the AMERICAN JOURNAL OF PHOTOGRAPHY. A title page and complete index for the year is sent to every subscriber. The wise photographer, be he professional or amateur, will lose no time in having his journals bound, so as to have the volume of the year in a compact shape, handy for reference.

As to the value of the volume for the past year we can but repeat what was stated in previous years, that all we ask is a perusal of the table of contents as set forth in the index; so much for its intrinsic value. Then again a careful perusal of the whole volume will fail to show a single line or thought which would debar the journal from a place in any library or centre table in the land.

The editor has labored faithfully, and used his best endeavors to place the AMERICAN JOURNAL OF PHOTOGRAPHY in the foremost rank of periodical literature, and lay all genuine matters photographic before the interested public at large, without fear or favor to anyone. In this course he has been ably seconded by the publishers. In addition to technical photographic matters, and news and formulæ, we have given a number of literary papers upon various subjects,—scientific, artistic, educational, and historical, interspersed occasionally with humorous satire, while our page maintained throughout the year, "In the Twilight Hour," stands worthy of the attention of every reader.

Not the least of features of value to the photographic public are the advertising pages of the AMERICAN JOURNAL OF PHOTOGRAPHY, forming a complete record of the commercial feature of the art science, and where are to be found notices of what is new and novel in the market, as well as announcements and extra inducements held out by standard stockdealers. These pages are of especial value to every professional photographer, while to the advertiser they offer the best medium to bring his wares and announcements before the photographic public. That this is mutually recognized is apparent to all who have had experience with the journal.

That the editor's and publishers' efforts are appreciated by the public at large is evinced by the increasing subscription list. These efforts, if possible, will be increased during the following year; every nerve will be strained to keep the journal at the head of the photographic press in the country. In return, we ask the co-operation of our patrons.

Renew your subscriptions promptly, and if you have anything of value relating to photography, send it to us for publication.

In conclusion we will say, don't neglect to bind your volume. If you have no bookbinder, send the loose numbers to us, and we will have it done for you at a nominal figure. Renew your subscription or advertising contract as the case may be, and by these means let the editor and publishers know that their efforts are appreciated.

A Memorial Volume.—The authorities of the Moravian church in America contemplate issuing in the near future a Memorial Volume, as a fitting monument of the one hundred and fiftieth anniversary of the establishment of the Unitas Fratrum in America. The squi-centennial festivities celebrated with so much eclat in Bethlehem during the last week in June, were but a passing episode. The coming volume, however, will be a memorial which will last for ages, and be sought as an authority for centuries to come—as it will not only give the annals of the greatest Missionary Church of America, but virtually be a history of Northeastern Pennsylvania, covering both the colonial as well as the revolutionary period.

No society, church, or organization in Pennsylvania, with the single exception of the Historical Society of Pennsylvania, is so rich in colonial manuscripts, portraits, and sketches relating to provincial history as are the archives of the Moravian Church stored at Bethlehem.

For the first time within the history of the church are these priceless literary and historical treasures to be put into such shape as to be accessible to the general public, by the means of this Memorial Volume.

Not the least feature of this book will be the illustrations. Over one hundred full-page illustrations are already prepared, in addition to numerous embellishments printed in the text. These plates will reproduce almost all the quaint portraits painted by Haidt, the Artist Missionary, together with numberless sketches and views made by the old itinerating missionaries. Not the least curious is a reproduction of a sketch representing the baptism of the first three Indian converts baptized within the old chapel at Bethlehem, which is still standing.

The illustration of this Memorial Volume would have been impossible without the aid of photography. Thus far, though far from complete, it has necessitated the making of over five hundred negatives, over two hundred of which were special color-stained plates prepared expressly for this purpose. Most all of the photographic work had to be done within the walls of the archive room, with only such facilities as were at hand, there being no place where a copying bench or camera could be placed.

The subjects after being photographed have been reproduced by the photo-mechanical half-tone process, so as to present the best results, and obviate all questions as to their permanency.

No work thus far published in Pennsylvania has required so much photographic work and manipulation as the one in question. The illustrations of the completed Volume will stand as a triumph to photography, and the entire work will prove a lasting memorial to those devout men and women who a century and a half ago came to these western wilds to establish a Missionary Church, which should preach the gospel to all men, without distinction as to race, color, or nationality.

Avoid Forgetfulness.—A successful business man says there were two things which he learned when he was eighteen, which were ever afterward of great use to him, namely: "Never to lose anything and never to forget anything." An old lawyer sent him with an important paper, with certain instructions what to do with it. "But," inquired the young man, "suppose I lose it; what shall I do then?" "You must not lose it!" "I don't intend to," said the young man, "suppose I should happen to?" "But I say you *must not* happen to; I shall make no provision for any such occurrence; you must not lose it!"

This put a new train of thoughts into the young man's mind, and he found that if he was determined to do a thing, he could do it. He made such a provision against every contingency that he never lost anything. He found this equally true about forgetting. If a certain matter of importance was to be remembered, he pinned it down on his mind, fastened it there, and made it stay. He used to say: "When a man tells me that he forgot to do something, I tell him he might as well have said: 'I do not care enough about your business to take the trouble to think of it again.'" I once had an intelligent young man in my employment who deemed it sufficient excuse for neglecting any important task to say, "I forgot it." I told him that would not answer. If he was sufficiently interested he would be careful to remember. It was because he did not care enough that he forgot it. I drilled him with this truth. He worked for me three years, and during the last of three he was utterly changed in this respect. He did not forget a thing. His forgetting, he found, was a lazy, careless habit of mind, which he cured.—*Ex.*

Interesting Photography.—Miss Anna Bell Swayne of Kennett Square, who drove to West Chester on Thursday to attend the meet-

ing of the World's Fair Auxiliary Society, visited by appointment, in the afternoon, the residence of Dr. Alfred E. Baker, "Norwynden," East Bradford, and took a number of photographs of the place, different views being taken. Miss Swayne is arranging to take phototographs of a number of points of historic interest in Chester county, to be used in the exhibit of woman's work from this country. She has also consented to bring her camera to the next meeting of the society, in October, in order to photograph a number of the members, a memento to them of their work in the behalf of their country.

When the Corner-Stone of the Holy Trinity (Episcopal) church at the Southwest corner of Walnut street and Rittenhouse Square, Philadelphia, was laid thirty-five years ago, May 25th, 1857, beside the usual deposit of copies of the Holy Bible, Book of Common Prayer, and the newspapers and coins of the day, a number of photographic prints were deposited in the copper box before it was soldered up and placed in its final resting place. This innovation was made at the instance of Constant Guillou one of the earliest amateur photographers in Philadelphia, for the instruction and benefit of the photographic guild years hence, when the contents of the corner-stone of the sacred edifice should again come to the light of day.

The prints are all photographic copies of the architect's original drawings of the church, and are printed upon every kind and make of paper, and representing every process and manipulation then known or in use, each process and manipulation being carefully endorsed upon the print even to the smallest detail.

Early Daguerreotype Days.—The interesting series of historical papers published under above title in the *American Journal of Photography* are resumed this month. The non-arrival of the illustrations made it inexpedient to continue the text in the last number.

Punctuality.—One cannot begin too early in life to discipline himself to habits of the most exacting punctuality in keeping every engagement and the performance of service, be it little or great. Great men in all ages have been noted for punctuality. They believed an act to be well done must be done promptly.

Photographic Hints and Formulæ.

A Correction.—The New Platinum Process, by Ganichot.—An unfortunate typographical error crept into our journal of last month, notwithstanding the careful proof-reading to which every page is subjected. This is still more unaccountable from the fact that the formulæ were correct in the proof sheets passed by the editor. We would ask our readers to refer to the pages, and kindly make the corrections at the proper place, viz.

Page 491, the fifth line should read: Ferric chloride (dry), 125 grams. Twenty-first line: Chloro-platinate of Soda, 2.5 grams.

On page 492, sixth line: Oxalic acid, 25 grams.

How to Use Glue.—For glue to be properly effective, it requires to penetrate the pores of the wood, and the more a body of glue penetrates the wood the more substantial the joint will remain. Glue that takes the longest to dry is to be preferred to glues that dry quickly, the slow-drying glues being always the strongest, other things being equal. For general use no method gives such good results as the following: Break the glue up small, put into an iron kettle, cover the glue with water, and allow to soak twelve hours; after soaking, boil until done. Then pour it into an air-tight box; leave the cover off until cold; and then cover up tightly. As glue is required, cut a portion and melt in the usual way. Expose no more of the made-glue to the atmosphere for any length of time than is necessary, as the atmosphere is very destructive to made-glue. Never heat made-glue in a pot that is subjected to the direct heat of the fire or lamp. All such methods of heating glue cannot be condemned in terms too severe. Do not use thick glue for joints or veneering. In all cases work it well into the wood in a similar manner to what painters do with paint. Glue both surfaces of your work, excepting in the case of veneering. Never glue upon hot wood, or use hot cauls to veneer with, as the hot wood will absorb all the water in the glue too suddenly, and leave only a very small residue with no adhesive power in it.—*The Manufacturer and Builder.*

Photographic Scissors and Paste.

The Sound of Light.—One of the most wonderful discoveries in science that have been made within the last year or two is the fact that a beam of light produces sound, says the *American Art Journal.* A beam of sunlight is thrown through a lens on a glass vessel that contains lampblack, colored silk, or worsted, or other substances. A dish, having slits or openings cut in it, is made to revolve swiftly in this beam of light, so as to cut it up, thus making alternate flashes of light and shadow. On putting the ear to the glass vessel, strange sounds are heard so long as the flashing beam is falling on the vessel.

Recently, a more wonderful discovery has been made. A beam of sunlight is made to pass through a prism, so as to produce what is called the solar spectrum, or rainbow. The disk is turned, and the colored light of the rainbow is made to break through it. Now, place the ear to the vessel containing the silk, wool, or other material. As the colored lights of the spectrum fall upon it, sounds will be given by different parts of the spectrum, and there will be silence in other parts.

For instance, if the vessel contains red worsted, and the green light flashes upon it, loud sounds will be given. Only feeble sounds will be heard when the red and blue parts of the rainbow fall upon the vessel, and other colors make no sound at all. Green silk gives sound best in red light. Every kind of material gives more or less sound in different colors, and utters no sound in others. The discovery is a strange one, and it is thought more wonderful things will come from it.

That ether is capable of causing sad havoc when used in a careless manner, users of saturators are doubtless aware. About a fortnight ago a photographer in Paris dropped a jar of collodion ; his assistants immediately commenced to mop it up, but having omitted to open the windows, the fumes reached a stove in an adjoining room, and fired, with the result that the building took fire, and it was afterwards ascertained that two people lost their lives.

A Portable Lantern Frame and Screen.—Now that the lantern season is once more upon us, each one interested in lantern work will be busy preparing for the long winter evenings. For the benefit of those who are in want of a cheap, as well as a portable lantern-frame and screen, I herewith give particulars of one I have just made, and which anyone can make for themselves.

Procure one dozen ash broomsticks, plain, without turned-heads, at 3s. 6d. a dozen, 50 inches long. Get your local tinner to make 8 sockets, 6 inches long, to fit the broomsticks. Also 4 angle pieces same length for the corners. You can use the sticks full length, or cut them to 48 inches, and fit them to the sockets. Screw the sockets fast to one end of the sticks, leaving one end loose, to allow for taking to pieces for convenience in packing up.

When all the pieces are fitted together we will have a frame 12 feet square, or by leaving out one piece on each side, it will make an 8 foot frame, suitable for an ordinary room or small school. If all the pieces are sandpapered and varnished with oak varnish, it forms a nice frame, fit for any room or company.

Sheeting, suitable for showing lantern slides on, can be had from most drapery establishments. Mine is best strong bleached sheeting cotton, 108 inches wide. Procure some of same quality about 40 inches wide, cut it down the centre; this will give two pieces of proper width for sewing to either side of the wide piece. Next, make a hem at one end, and on one side, wide enough to allow the poles to slip through, and put tapes on the opposite sides of the hems. This forms a frame and sheet which can be put together in a few minutes by anyone, and packed up as readily.—*George Kilburn in Optical Magic-Lantern Journal.*

He (on the shore with a camera, meeting a girl)—"Ah, I beg your pardon; may I take you?"

She (with eagerness, but blushing)—"Yes, I'm perfectly willing; but you'll have to ask papa first."

A friend of ours, whose name will be unmentioned, thinks of forming a full band in his own person. Being a good violinist and an admirable person for any instrument requiring wind, he is now going as a drummer for a photographic stock house. We have no doubt he will be well received.

We shall never smile again until we exchange photographs with the young man that put shoemaker's wax on the benches of the front portico of this office.—*Easton Free Press.*

For Ice Cream Eaters.—A raw onion chewed slowly and swallowed without undue haste will destroy the odor of ice cream from the breath.—*Texas Siftings.*

Minneapolis Camera Club.—A lantern slide exhibition by the members of the club, together with an informal discussion of the various methods of development was held at the club rooms on Wednesday, Oct. 2. The meeting was attended by the members and their friends.

Platinum Mines of Russia.—The platinum beds of the Ural Mountains, according to the *Journal de la Chambre de Commerce de Constantinople*, "are the only ones in the world in which this metal is found in grains. Platinum is found in Brazil and in the Cordilleras in the hard serpentine rocks, but never in the form of grains. The platinum beds of the Ural Mountains are found in various districts. In the north, at Besserski, in the Government of Perm, in the District of Knotourski, and in the State properties of Goroblagodatski, where 66 mining concessions have been granted. All the beds of the nothern region are situated in the basin of the river Touri, in that of the tributary stream of Taghil, and in other tributaries higher up. On the western declivity of the Ural Mountains there is another platinum bed near the river Outka, a tributary of the Tchoussova, and the basins of the higher tributaries of the Outka, near the Ural river. The platinum found in these places is in the form of grains, in sand frequently containing gold. The weight of these grains is from 17 to 21 grams to every 1640 kilograms of sand.

Hours of Gloom.—To every man there are dark hours when he feels inclined to abandon his best interests—hours when his heart's dearest hopes appear delusive. Hours when he feels unequal to the burden, when all of his aspirations seem worthless. Let no one think that he alone has dark hours. They are the common lot of humanity. They are the touchstone to try whether we are current coin or not.

Marrying by Photograph.—A prosperous Slavonian rancher in the south end of the Huachuca mountains some time ago visited his native land, and found a large number of worthy young ladies among his acquaintances who would be only too happy to find homes and husbands in this land of progress and liberty. Securing the photographs of a number of these young ladies, he brought them back with him, and lost no opportunity to show them to his bachelor friends and neighbors. He told them that he had the promise of these young ladies that they would come to America and marry the man he would recommend, and as a consequence, a great many of his neighbors have excellent wives, each one selecting his choice from the photographs.

In the Twilight Hour.

A HOUSE is no home unless it contain food and fire for the mind as well as for the body.—*Margaret Fuller Osseli.*

SOME people are always grumbling because roses have thorns. I am thankful that thorns have roses.—*Alphonse Karr.*

"MUSIC is the link which binds earth to heaven. It strengthens faith, brightens hope, and fills the heart with joy."

IF a man can write a better book, preach a better sermon, or make a better mouse-trap than his neighbor, though he builds his house in the woods, the world will make a beaten path to his door.—*Emerson.*

TRUE FRIENDSHIP—one soul in two bodies.—*Pythagoras.*

KINDNESS—a language which the dumb can speak, and the deaf can understand. —*Bovee.*

"CHARITY is a precious coin dropped into the hearts of men from the mint of heaven."

"HAPPINESS is a perfume you cannot pour on others without getting a few drops yourself."

HABIT is a cable; we weave a thread of it every day, and at last we cannot break it.—*Horace Mann.*

HUMAN doctrines cannot cure a wound in the conscience. The remedy is too weak for the disease. Conscience, like the vulture of Prometheus, will still lie gnawing, notwithstanding all that such doctrines can do.

WHAT you have at your death, let it be without controversy, else the lawyers will be your heirs. *Osborne.*

THE choicest buildings have the lowes, foundations.

INTEREST is the spur of the people, but glory that of great souls.—*J. J. Rousseau.*

THE reason why so few marriages are happy is because young ladies spend their time in making nets, not in making cages. —*Swift.*

PREJUDICES are notions or opinions which the mind entertains without knowing the grounds and reasons of them, and which are assented to without examination. —*Bishop Berkeley.*

NO ashes are lighter than those of incense, and few things burn out sooner.—*Landor.*

MEN are every day saying and doingt from the power of education, habit and imitation, what has no root whatever in their serious convictions.—*Channing.*

THE greatest friend of truth is time; her greatest enemy is prejudice, and her constant companion is humility.—*Colton.*

SOME men are more beholden to their bitterest enemies than to friends who appear to be sweetness itself. The former frequently tell the truth, but the latter never.—*Cato.*

THERE is no funeral so sad to follow as the funeral of our own youth, which we have been pampering with fond desires, ambitious hopes, and all the bright berries that hang in poisonous clusters over the path of life.—*Bossuet.*

ALL nobility in its beginnings was somebody's natural superiority. *R. W. Emerson.*

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DEVOTED TO PHOTOGRAPHY IN ITS
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